IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

In re Patent Application of: STACHOWIAK
Serial No. 10/672,066
Filed: September 29, 2003
Title: HEAT TREATABLE COATED ARTICLE WITH DUAL LAYER UNDERCOAT

Atty Dkt. 3691-587
C# M#
TC/A.U.: 1775
Examiner: Blackwell-Rudasill, G.
Date: February 8, 2006

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

☐ **Correspondence Address Indication Form Attached.**

☐ **NOTICE OF APPEAL**
Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner twice/finally rejecting applicant's claim(s). $500.00 (1401)/$250.00 (2401) $

☒ An appeal **BRIEF** is attached in the pending appeal of the above-identified application $500.00 (1402)/$250.00 (2402) $ 500.00

☐ Credit for fees paid in prior appeal without decision on merits -$ ( )

☐ A reply brief is attached. **(no fee)**

☐ Petition is hereby made to extend the current due date so as to cover the filing date of this paper and attachment(s)
One Month Extension $120.00 (1251)/$60.00 (2251)
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Any future submission requiring an extension of time is hereby stated to include a petition for such time extension. The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our **Account No. 14-1140.** A duplicate copy of this sheet is attached.

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Signature: _____

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of

STACHOWIAK — Atty. Ref.: 3691-587

Serial No. 10/672,066 — TC/A.U.: 1775

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For: HEAT TREATABLE COATED ARTICLE WITH DUAL LAYER UNDERCOAT

* *

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APPEAL BRIEF

Sir:

Applicant hereby appeals to the Board of Patent Appeals and Interferences from the last decision of the Examiner.

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(I) REAL PARTY IN INTEREST

The real party in interest is Guardian Industries Corp., a corporation of the country of the United States of America.

(II) RELATED APPEALS AND INTERFERENCES

The appellant, the undersigned, and the assignee are not aware of any related appeals, interferences, or judicial proceedings (past or present), which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

(III) STATUS OF CLAIMS

Claims 1-13, 15, 17-20 and 24 are pending. All claims, except for claims 2 and 20, stand rejected. Thus, these claims are on appeal herein. No claims have been officially allowed.

The status of claims 2 and 20 is not very clear. No clear formal art rejection has been made for claims 2 and 20. The Section 112 rejection of these claims has been overcome as indicated by the Advisory Action dated December 29, 2005 (however, the Advisory Action does not indicate whether these claims have now been allowed). Moreover, while claim 2 is mentioned at the bottom of page 4 of the final rejection, it is unclear if a formal art rejection has been made for this claim (whether claim 2 is part of the Section 103 rejection is arguable). Claim 20 has clearly not been rejected under Section 102 or Section 103.

Thus, it is requested that the Examiner officially allow claim 20, and indicate whether or not claim 2 has been allowed or rejected.

(IV) STATUS OF AMENDMENTS

The Amendment After Final filed December 6, 2005 has apparently been entered (see the Advisory Action dated December 29, 2005). Moreover, the Advisory Action dated December 29, 2005 indicates that the Amendment After Final filed December 6, 2005 has overcome the Section 112 rejection. Thus, no Section 112 rejection is currently outstanding.

(V) SUMMARY OF EXAMPLE EMBODIMENTS OF INVENTION

For purposes of example and without limitation, certain example embodiments of this invention relate to a coated article including an IR reflecting (blocking and/or absorbing) coating supported by a glass substrate. Different embodiments are disclosed in the specification. The coated articles may be used for architectural windows in certain example instances (e.g., see paragraphs 0001 and 0009). Solar control coatings are advantageous in architectural, because they can achieve a combination of reasonable visible transmission, desired coloration, and blockage of infrared (IR) radiation thereby helping to keep the building interior cool in summer months. The coated articles may be heat treated (e.g., thermally tempered) in certain example embodiments, for safety purposes.

In certain example embodiments, referring to Fig. 1 of the instant application, a coated article comprises a glass substrate (S); a layer comprising tin oxide (1) provided on and contacting a surface of the glass substrate (S); a layer comprising silicon nitride (2) provided on and contacting the layer comprising tin oxide (1); an infrared (IR) reflecting layer (3) located on the substrate over the layer comprising tin oxide and over the layer comprising silicon nitride. In certain example embodiments, the IR reflecting layer comprises one or more of NiCr, Cr, Nb, and NbZr (see paragraph 0010), so that the coated article has no infrared (IR) reflecting layer comprising significant amounts of Ag or Au. The elimination of any Ag or Au based layer makes the coating much easier and cheaper to manufacture, and also eliminates the need for many other layers. Thus, a simpler and more efficient coating can be provided.

However, the use of NiCr, Cr, Nb and NbZr as an IR reflecting layer in a coating has been problematic in the past. Paragraph 0002 of the instant specification explains that the use of such IR reflecting layer materials typically required a very thick silicon nitride layer immediately thereunder. However, such thick silicon nitride layers used immediately under such IR reflecting layers have been problematic in that high compressive stress resulting therefrom has lead to durability problems (see paragraphs 0002 and 0003 of the instant specification).

There problems in NiCr, Cr, Nb and NbZr based coatings have been addressed and/or overcome herein by replacing the typical thick silicon nitride undercoat with a dual layer undercoat (see paragraphs 0005-0006 of the instant specification) . The dual layer undercoat includes a tin oxide (e.g., SnO_2) layer on the glass surface and a silicon nitride layer thereover. Tin oxide is advantageous in this particular application in that it is relatively durable, and is a low stress material with excellent adhesion to glass. Moreover, the sputtering rate for tin oxide is much higher than that of silicon nitride, so that the coating can be manufactured quicker.

Thus, the aforesaid problems of high cost (due to slow deposition rate) and durability (due to high compressive stress) can be overcome through the use of tin oxide as a bottom portion of the undercoat. Accordingly, the tin oxide portion of the undercoat allows the coating to be sputtered at a faster rate thereby reducing costs, and also allows part of the silicon nitride layer to be removed thereby reducing internal stress and improving durability. On the other hand, the silicon nitride portion of the undercoat is provided in order to prevent and/or reduce oxygen diffusion from the glass or tin oxide

into the NiCr, Cr, Nb, and/or NbZr during heat treatment, thereby improving heat treatability.

(VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1, 3-6, 8-13, 15, 17-18 and 21 are unpatentable under 35 U.S.C. Section 103(a) as being allegedly obvious over Lingle '662 (US 2002/0064662) in view of both Ohsaki (US 5,543,229) and Lingle '585 (US 5,688,585).

2. Whether claims 7, 19 and 24 are unpatentable under 35 U.S.C. Section 103(a) as being allegedly obvious over Lingle '662 (US 2002/0064662) in view of Ohsaki (US 5,543,229), Lingle '585 (US 5,688,585), and Ebisawa.

Claims 2 and 20 – No Art Rejection

Note that *no formal art rejections have been made for claims 2 and 20.* The Section 112 rejection of these claims has been overcome as indicated by the Advisory Action dated December 29, 2005. Moreover, while claim 2 is mentioned at the bottom of page 4 of the final rejection, it is unclear if a formal rejection has been made for this claim (whether claim 2 is part of the Section 103 rejection is arguable). Claim 20 has clearly not been rejected under Section 102 or Section 103.

(VII) ARGUMENT

It is axiomatic that in order for a reference to anticipate a claim, it must disclose, teach or suggest each and every feature recited in the claim. See, e.g., Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983). The USPTO has the burden in this respect.

Moreover, the USPTO has the burden under 35 U.S.C. Section 103 of establishing a *prima facie* case of obviousness. In re Piasecki, 745, F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). It can satisfy this burden only by showing that some objective teaching in the prior art, or that knowledge generally available to one of ordinary skill in the art, would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Before the USPTO may combine the disclosures of the references in order to establish a *prima facie* case of obviousness, there must be some suggestion for doing so. In re Jones, 958 F.2d 347 (Fed. Cir. 1992). Even assuming, *arguendo*, that a given combination of references is proper, the combination of references must in any event disclose the features of the claimed invention in order to render it obvious.

Moreover, the law is clear that a claim feature is "inherent" in a reference only if that feature is "necessarily" present in the reference, "not merely probably or possibly present." *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed. Cir. 2002).

Claim 1

Claim 1 stands rejected under Section 103(a) as being allegedly unpatentable over Lingle '662 in view of Ohsaki and Lingle '585. This 3-way Section 103(a) rejection should be reversed for at least the following reasons.

Claim 1 requires "a layer comprising tin oxide provided on and contacting a surface of the glass substrate; a layer comprising silicon nitride provided on and contacting the layer comprising tin oxide; an infrared (IR) reflecting layer located on the substrate over the layer comprising tin oxide and over the layer comprising silicon nitride, wherein the IR reflecting layer comprises one or more of NiCr, Cr, Nb, and NbZr, and wherein the coated article has no infrared (IR) reflecting layer comprising significant amounts of Ag or Au." In other words, the IR reflecting layer cannot be a silver layer. For example, see Fig. 1 of the instant application which illustrates glass/SnO_2/Si_xN_y/IR refl/dielectric. The cited art fails to disclose or suggest the aforesaid features of claim 1.

Lingle (US 2002/0064662) discloses a double-silver low-E coating, where the IR reflecting is performed by first and second *silver* based layers. There is no disclosure or mention in Lingle '662 of an IR reflecting layer comprising one or more of NiCr, Cr, Nb, and/or NbZr as required by claim 1. Instead, Lingle '662 teaches directly away from the invention of claim 1 because Lingle '662 discloses two silver layers for IR reflecting layers – which is expressly excluded by claim 1. In particular, claim 1 expressly excludes the low-E coating of Lingle '662 because claim 1 states that the coated article has no infrared (IR) reflecting layer comprising significant amounts of Ag or Au.

One of ordinary skill in the art would never have modified Lingle '662 as alleged in the Office Action. Lingle '662 expressly states in the Abstract that he desires a visible

transmission of at least 70%, and one of ordinary skill in the art would not have modified Lingle '662 in a manner which would have prevented this from occurring. In particular, the Office Action contends that it would have been obvious to have replaced Lingle '662's silver (Ag) IR reflecting layers with the Ni or NiCr of Lingle '585 for example. One of ordinary skill in the art would never have done this. Specifically, Lingle '662 relates to a low-E coating designed for high visible transmittance (at least 70 or 75% transmittance as taught in the abstract) so as to be useful for vehicle windshield applications. One of ordinary skill in the art would never have replaced the Ag layers of Lingle '662 with the Ni or NiCr of Lingle '585 because this would significantly degrade the transmittance of the coated article, such that the product could no longer be used for its desired windshield purpose or any other suitable purpose. In particular, such a modification (replacing both Ag layers with Ni or NiCr) would result in a coated article having a transmittance well below 50%, and probably below 10%, so that the product could not practically be used as a vehicle windshield or any other suitable application, thereby destroying the functionality and an intended purpose of Lingle '662. *Lingle '662 expressly states in the Abstract that he desires a visible transmission of at least 70%, and one of ordinary skill in the art would not have modified Lingle '662 in a manner which would have prevented this from occurring.*

Lingle '662 expressly states that the coated article of Lingle '662 has a visible transmission (T_{vis}) of at least 70% both before and after heat treatment (see Abstract, Table 3, and paragraph [0003]). One of ordinary skill in the art would never have modified Lingle '662 as alleged in the Office Action to replace the two Ag layers with two like layers of NiCr (or Ni), because this would likely cause the visible transmission

to drop to 10-20% or less thereby rendering the coated article useless as a vehicle windshield or typical IG window. Such a modification would destroy the functionality and purpose of Lingle '662, which would not have been done by one of ordinary skill in the art. There is no suggestion or motivation in the cited art for the alleged modification. Hindsight is not permitted.

It will be appreciated by those of skill in the art that replacing two silver layers in a coating with *two* like NiCr/Ni layers would cause the visible transmission to severely drop and the color to shift dramatically. NiCr is much more absorbing than is silver (i.e., much less transparent). This is why those of skill in the art would never have used *two* IR blocking NiCr or Ni layers in the same coating of Lingle '662. There is no teaching in the art of record of using two Ni or NiCr IR reflecting layers in the same coating as the Office Action suggests to do. One of ordinary skill in the art would never have done this because this would cause the visible transmission to be so low that the coated article, from a practical point of view, could not be used for Lingle 662's desired applications. The Section 103(a) rejection is fundamentally flawed.

Likewise, one of ordinary skill in the art would never have replaced the *two* Ag layers of Lingle '662 with the Cr of Ohsaki because this would significantly degrade the transmittance of the coated article (same reasons as explained above with respect to NiCr and Ni). Cr is like NiCr and Ni, in that it is highly absorbing and not very transparent.

Thus, not only is there no suggestion or motivation in the art for the alleged modification, but the art teaches directly away from the invention of claim 1.

Claim 2

Claim 2 requires that "a combined thickness of the layer comprising tin oxide and the layer comprising silicon nitride is from 700 to 900 Å and wherein the coated article has blue glass side reflective color." The cited art fails to disclose or suggest these claimed features.

There is nothing in the cited art that would indicate that modifying Lingle '662 as alleged by the Office Action (which would never be done for the reasons discussed above) would result in a *blue* glass side reflective color. The cited art simply fails to disclose or suggest this. Moreover, it is well established that a claim feature is "inherent" in a reference only if that feature is "necessarily" present in the reference, "not merely probably or possibly present." *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed. Cir. 2002). Here, the blue color is neither mentioned nor inherent in the alleged modified product alleged by the Office Action. Instead, the use of two NiCr, Ni or Cr layers would tend to make the product very dark so that it could not even be used as a window, and such a product would not have "blue" glass side reflective color as required by claim 2.

The claimed thickness range of claim 2 also is not disclosed or suggested by the cited art. In particular, Lingle '662 never states what thickness layer 3 would be if it were to comprise tin oxide. Table 1 in Lingle '662 merely states what the thickness of titanium oxide would be for layer 3; no thickness is every discussed as to tin oxide for layer 3. Thus, there can be no prima facie case of obviousness in this respect.

Claim 5

Claim 5 requires that the IR reflecting layer is in *direct contact* with the layer comprising silicon nitride. The cited art fails to disclose or suggest this feature.

In Lingle '662, the Ag layer is not in directly contact with a silicon nitride layer. Thus, even if the alleged modification were made, the invention of claim 5 still would not be met because the two layers would not be in directly contact with each other.

Claim 13

Claim 13 requires that the coated article includes a multi-layer coating *consisting essentially of* the layer comprising tin oxide, the layer comprising silicon nitride, the IR reflecting layer, and the dielectric layer. The cited art clearly fails to disclose or suggest this. Even if Lingle '662 was modified as alleged in the Office Action to replace the two Ag layers with two like Ni, NiCr or Cr layers, the coating would still have 12 or so layers which is expressly prohibited by the "consisting essentially" language of claim 13. Thus, even the alleged combination would not meet the invention of claim 13.

Claims 15 and 24

Claims 15 and 24 also require that "the coated article has no infrared (IR) reflecting layer comprising significant amounts of Ag or Au." Lingle '662 fails to disclose or suggest this as discussed above. Moreover, as explained above, one of ordinary skill in the art would never have modified Lingle '662 to overcome this flaw. See the arguments set forth above with respect to claim 1.

Claim 18

Claim 18 requires that the IR reflecting layer is in *direct contact* with the layer comprising silicon nitride. The cited art fails to disclose or suggest this feature.

In Lingle '662, the Ag layer is not in directly contact with a silicon nitride layer. Thus, even if the alleged modification were made, the invention of claim 18 still would not be met because the two layers would not be in directly contact with each other.

Claim 20

Claim 20 requires that "a *combined thickness of the layer comprising tin oxide and the layer comprising silicon nitride is from 700 to 900 Å.*" The cited art fails to disclose or suggest these claimed features.

The claimed thickness range of claim 20 is not disclosed or suggested by the cited art. In particular, Lingle '662 never states what thickness layer 3 would be if it were to comprise tin oxide. Table 1 in Lingle '662 merely states what the thickness of titanium oxide would be for layer 3; no thickness is every discussed as to tin oxide for layer 3. Thus, there can be no prima facie case of obviousness in this respect. Hindsight is not permitted.

CONCLUSION

In conclusion it is believed that the application is in clear condition for allowance; therefore, early reversal of the Final Rejection and passage of the subject application to issue are earnestly solicited.

Respectfully submitted,

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(VIII) CLAIMS APPENDIX

1. A coated article comprising:

a glass substrate;

a layer comprising tin oxide provided on and contacting a surface of the glass substrate;

a layer comprising silicon nitride provided on and contacting the layer comprising tin oxide;

an infrared (IR) reflecting layer located on the substrate over the layer comprising tin oxide and over the layer comprising silicon nitride, wherein the IR reflecting layer comprises one or more of NiCr, Cr, Nb, and NbZr, and wherein the coated article has no infrared (IR) reflecting layer comprising significant amounts of Ag or Au; and

a dielectric layer provided on the substrate over at least the IR reflecting layer.

2. The coated article of claim 1, wherein a combined thickness of the layer comprising tin oxide and the layer comprising silicon nitride is from 700 to 900 Å and wherein the coated article has blue glass side reflective color.

3. The coated article of claim 1, wherein the dielectric layer located over at least the IR reflecting layer comprises silicon nitride.

4. The coated article of claim 1, wherein the coated article is heat treated.

5. The coated article of claim 1, wherein the IR reflecting layer is in direct contact with the layer comprising silicon nitride.

6. The coated article of claim 1, wherein the coated article is one of a monolithic window unit, an insulating glass (IG) window unit, and a laminated vehicle windshield.

7. The coated article of claim 1, wherein the layer comprising tin oxide further comprises nitrogen.

8. The coated article of claim 1, wherein the layer comprising silicon nitride further comprises from 1 to 12 % aluminum.

9. The coated article of claim 1, wherein the coated article has a visible transmission from about 6 to 80%.

10. The coated article of claim 1, wherein the coated article has a visible transmission of from about 10-50%.

11. The coated article of claim 1, wherein the coated article has a sheet resistance (R_s) of less than 250 ohms/square.

12. The coated article of claim 1, wherein the coated article has a sheet resistance (R_s) of less than 100 ohms/square.

13. The coated article of claim 1, wherein the coated article includes a multi-layer coating consisting essentially of the layer comprising tin oxide, the layer comprising silicon nitride, the IR reflecting layer, and the dielectric layer.

14. (Canceled)

15. A heat treated coated article comprising:

a glass substrate;

a layer comprising tin oxide supported by the glass substrate and being located beneath any and all IR reflecting layer(s) of the coated article;

a layer comprising silicon nitride provided on and contacting the layer comprising tin oxide;

an infrared (IR) reflecting layer located over the layer comprising tin oxide and over the layer comprising silicon nitride, wherein the IR reflecting layer comprises one or more of NiCr, Cr, Nb, and NbZr, and wherein the coated article has no infrared (IR) reflecting layer comprising significant amounts of Ag or Au; and

a dielectric layer provided on the substrate over at least the IR reflecting layer.

16. (Canceled)

17. The coated article of claim 15, wherein the dielectric layer located over at least the IR reflecting layer comprises silicon nitride.

18. The coated article of claim 15, wherein the IR reflecting layer is in direct contact with the layer comprising silicon nitride.

19. The coated article of claim 15, wherein the layer comprising tin oxide further comprises nitrogen.

20. The coated article of claim 15, wherein the coated article has a sheet resistance (R_s) of less than 250 ohms/square, and wherein a combined thickness of the layer comprising tin oxide and the layer comprising silicon nitride is from 700 to 900 Å.

21-23. (Canceled)

24. A heat treated coated article comprising:

a glass substrate;

a layer comprising tin oxynitride supported by the glass substrate and being located beneath any and all IR reflecting layer(s) of the coated article;

a layer comprising silicon nitride provided on and contacting the layer comprising tin oxynitride;

an infrared (IR) reflecting layer located over the layer comprising tin oxynitride and over the layer comprising silicon nitride, wherein the IR reflecting layer comprises one or more of NiCr, Cr, Nb, and NbZr, and wherein the coated article has no infrared (IR) reflecting layer comprising significant amounts of Ag or Au; and

a dielectric layer provided on the substrate over at least the IR reflecting layer.

(IX) EVIDENCE APPENDIX

None

(X) RELATED PROCEEDINGS APPENDIX

None